

Freeway Management

21ST CENTURY OPERATIONS USING 21ST CENTURY TECHNOLOGIES

FREEWAY MANAGEMENT CHALLENGES

The overriding objective of freeway management operational strategies and programs is to minimize congestion and its side effects. Freeway management in the broadest context entails the use of various strategies to combat congestion and its damaging effects: driver delay, frustration and inconvenience, reduced safety, and decline in air quality. The most effective way to combat congestion is to take action before traffic flow deteriorates and congestion forms. This is often not possible, and the best alternative is to delay the onset of congestion and speed the recovery in an effort to minimize the inefficiencies caused by congestion.

WHY WE'RE CONCERNED

The safe and efficient operation of freeway facilities is critical to serving the mobility needs of people and freight and fostering economic growth and development. Freeway operators and motorists are continually facing increased levels of congestion and operational inefficiencies. The major contributors are population growth and increased vehicle use combined with inadequate roadway capacity.

The effective management and operation of freeways are critical to the transportation network. This requires that the appropriate technologies be deployed and integrated and actively managed to allow agencies to monitor traffic and roadway conditions, share information with appropriate interests, and proactively take the appropriate actions in response to changing conditions.



WHAT WE'VE LEARNED

Transportation officials need to make the most efficient use of the existing roadway infrastructure while continuing to investigate new, low-cost alternatives to constructing new roadway capacity on freeways. This requires a commitment to operating the transportation system and a shift from a culture, policies, and programs focused only on roadway expansion solutions. This involves supporting and providing the necessary resources to:

- Continuously improve traffic operations
- Establish and sustain partnerships
- Enhance freeway management programs
- Develop and utilize operational strategies
- Deploy Intelligent Transportation Systems (ITS) technologies
- Proactively manage and control traffic

Freeway management alone will not solve all the congestion problems transportation officials face today. However, investments in freeway management programs and strategies will assist agencies with meeting the needs of the traveling public and getting the most efficiency out of the existing roadway infrastructure. Primary strategies include traffic management centers (TMCs), ramp management and control, lane management, and high-occupancy vehicle (HOV) facilities. Agencies have successfully demonstrated that managing and controlling traffic on freeways has the potential to:

- Reduce travel times by up to 48 percent
- Increase travel speeds by up to 62 percent
- Increase roadway capacity by up to 25 percent
- Decrease crashes by up to 50 percent
- Reduce time crashes block traffic by up to 50 percent

Even though freeway management is a proven concept and the benefits of the various operational strategies are well documented, there has been an inconsistent application of these strategies and techniques by public agencies. Freeway management involves combining personnel, operational strategies, advanced technologies, TMCs, traffic management techniques, and other services to proactively manage and control traffic. It provides agencies with the ability to:

- Monitor roadway conditions, and detect and verify incidents
- Identify recurring and non-recurring traffic bottlenecks
- Implement lane management strategies
- Manage and operate HOV facilities
- Control freeway ramp meters
- Provide travel condition information

FUTURE DIRECTIONS

The Federal Highway Administration (FHWA) has defined priority areas for attention and near-term action, one of which is congestion mitigation. Freeway management can mitigate the impacts of congestion. To foster proactive management and control of traffic on freeway facilities, FHWA will pursue a number of initiatives to increase awareness of the benefits of freeway management, encourage regional collaboration and sharing of resources, develop agency capabilities, apply recommended practices, and deploy TMCs and ITS. Specifically, these initiatives will involve:

Collaboration and Consensus Building

Formulate and gain acceptance of the research and technology transfer needs to advance the practices of agencies

Raise Awareness and Motivate Action

Facilitate peer-to-peer exchanges, regional workshops, executive briefings, and tabletop exercises to raise agencies' awareness about the benefits of improving current practices

Technical Guidance and Capacity Building

Develop and deliver guidance materials, training, and self-assessment tools for agencies to assess and develop action plans to improve current practices

Applied Research

Develop tools, conduct field operational tests, quantify potential benefits and prepare materials to assist with implementing innovative applications

Near term priorities will focus on:

- Freeway and traffic operations management
- TMCs
- Managed lanes
- HOV facilities

EXPECTED PRODUCTS AND MILESTONES IN 2004

- Offer updated freeway management and operations training course
- Offer HOV facilities training course
- Offer new configuration management for transportation management systems training course
- Distribute TMC operations concept and requirements primer and handbook
- Distribute TMC business planning and plans handbook
- Distribute migration plans and procedures for TMCs handbook
- Distribute testing and acceptance plans and procedures for TMCs handbook
- Distribute TMC operator requirements and position descriptions software
- Develop multi-year plan identifying research needs and projects to advance current freeway management practices

